

VIIP 2017 CLINICAL UPDATE

INTRODUCTION: NASA's Space Medicine community knowledge regarding the "Vision Impairment Intracranial Pressure", or VIIP, has been evolving over time. . Various measures of occupational health related to this condition had to be determined and then plans/processes put into place. The most robust of these processes were initiated in 2010. This presentation will provide a clinic update of the astronaut occupational health data related to VIIP.

METHODS: NASA and its international partners require its astronauts to undergo routine health measures deemed important to monitoring VIIP. The concern is that the spaceflight environment aboard ISS could cause some astronauts to have physiologic changes detrimental to either ongoing mission operations or long-term health related to the ocular system and possibly the CNS. Specific medical tests include but are not limited to brain/orbit MRI (NASA unique protocol), OCT, funduscopy and ocular ultrasound. Measures are taken prior to spaceflight, in-flight and post-flight. Measures to be reported include incidence of disc edema, globe flattening, choroidal folds, ONSD and change in refractive error.

RESULTS: 73 ISS astronauts have been evaluated at least partially for VIIP related measures. Of these individuals, approximately 1 in 7 have experienced disc edema. The prevalence of the other findings is more complicated as the medical testing has changed over time. Overall, 26 separate individuals have experienced at least one of the findings NASA has associated with VIIP. Another confounding factor is most of the astronauts have prior spaceflight experience at the time of the "pre-flight" testing.

DISCUSSION: In 2010 NASA and its US operating segment (USOS) partners (CSA, ESA and JAXA) began routine occupational monitoring and data collection for most VIIP related changes. Interpretation of that data is extremely challenging for several reasons. For example, the determination of disc edema is the most complete finding as we have had highly qualified optometrists routinely and competently performing post-flight funduscopy exams for the entirety of the ISS program. Yet in 2013 NASA added OCT to our in-flight suite of eye exams. Shortly after routine screening with the OCT, a new term appeared within VIIP vernacular – "subclinical disc edema". OCT has much greater ability to measure change within the retina and provides significantly more data to analyze, understand and communicate out.

Communicating VIIP data clearly adds even more challenge. Historically we've reported data per eye and not necessarily per person. This has led to difficulty in understanding how many individuals have experienced "VIIP" within the aerospace medicine community. The presenter will attempt to provide clear and concise communication of VIIP findings.